	Type	Hits	Search Text	DBs	Time Stamp
1	BRS	3567	water and (hydrogen adj peroxide) and molybdenum	USPAT; US-PGPUB	2003/05/14 16:06
2	BRS	2532	(water and (hydrogen adj peroxide) and molybdenum) and (etchant or etching or etch or remove or removing)	USPAT; US-PGPUB	2003/05/14 16:07
3	BRS	1952	((water and (hydrogen adj peroxide) and molybdenum) and (etchant or etching or etch or remove or removing)) and @ad<=20000320	USPAT; US-PGPUB	2003/05/14 16:07
4	BRS	1015	(((water and (hydrogen adj peroxide) and molybdenum) and (etchant or etching or etch or remove or removing)) and @ad<=20000320) and ph	USPAT; US-PGPUB	2003/05/14 16:07
5	BRS	461	((((water and (hydrogen adj peroxide) and molybdenum) and (etchant or etching or etch or remove or removing)) and @ad<=20000320) and ph) and (substrate or wafer)	USPAT; US-PGPUB	2003/05/14 16:11
6	BRS	444	(((((water and (hydrogen adj peroxide) and molybdenum) and (etchant or etching or etch or remove or removing)) and @ad<=20000320) and ph) and (substrate or wafer)) and (percentage or percent or "%" or ratio)	USPAT; US-PGPUB	2003/05/14 16:12
7	BRS	77	(((((water and (hydrogen adj peroxide) and molybdenum) and (etchant or etching or etch or remove or removing)) and @ad<=20000320) and ph) and (substrate or wafer)) and ((hydrogen adj peroxide) with (percentage or percent or "%" or ratio))	USPAT; US-PGPUB	2003/05/14 16:13

	U	1 [1]	Document ID	Issue Date	Pages	Title	Current OR
1	☐	☒	US 6375545 B1	20020423	18	Chemical mechanical method of polishing wafer surfaces	451/36
2	☐	☒	US 6365564 B1	20020402	23	Asymmetrical imide bleach activators and compositions employing the same	510/376
3	☐	☒	US 6281180 B1	20010828	13	Automatic dishwashing compositions containing water soluble cationic or amphoteric polymers	510/220

	Current XRef	Retrieval Classif	Inventor	S	C	P	2	3	4	5	Image Doc. Displayed	PT
1	257/E21.244; 257/E21.304; 451/41		Yano, Hiroyuki et al.	☒	☐	☐	☐	☐	☐	☐	US 6375545	☐
2	510/276; 510/302; 510/312; 510/313; 510/356; 510/367; 510/375; 510/421; 510/443; 510/456; 510/501		Kott, Kevin Lee et al.	☒	☐	☐	☐	☐	☐	☐	US 6365564	☐
3	510/223; 510/233; 510/252; 510/265; 510/309; 510/310; 510/318; 510/398; 510/434; 510/480; 510/500; 510/509; 510/510; 510/512; 510/531; 510/532; 510/533; 510/534		Tartakovsky, Alla et al.	☒	☐	☐	☐	☐	☐	☐	US 6281180	☐

	U	1 [1]	Document ID	Issue Date	Pages	Title	Current OR
4	☐	☒	US 6238592 B1	20010529	15	Working liquids and methods for modifying structured wafers suited for semiconductor fabrication	252/79.1
5	☐	☒	US 6178972 B1	20010130	31	Method and apparatus for manufacturing a semiconductor integrated circuit	134/1.3
6	☐	☒	US 5644147 A	19970701	14	Electro-optical device incorporating pixel transistors with plural gate electrodes	257/66
7	☐	☒	US 5062941 A	19911105	5	Electrolytic process for stripping a metal coating from a titanium based metal substrate	205/717
8	☐	☒	US 4746369 A	19880524	6	Peroxide selective stripping compositions and method	134/3

	Current XRef	Retrieval Classif	Inventor	S	C	P	2	3	4	5	Image Doc. Displayed	PT
4	252/79.2; 252/79.5; 257/E21.304; 438/691; 438/692; 438/693		Hardy, L. Charles et al.	☒	☐	☐	☐	☐	☐	☐	US 6238592	☐
5	134/2; 257/E21.228; 257/E21.575; 438/754; 438/906; 438/963		Harada, Shigeru et al.	☒	☐	☐	☐	☐	☐	☐	US 6178972	☐
6	257/344; 257/347; 257/350; 257/365; 257/72; 257/750; 257/758; 257/E21.412; 257/E29.147; 257/E29.151; 257/E29.275		Yamazaki, Shunpei et al.	☒	☐	☐	☐	☐	☐	☐	US 5644147	☐
7			Sue, Jiinjen A.	☒	☐	☐	☐	☐	☐	☐	US 5062941	☐
8	134/41; 216/108; 510/109; 510/202; 510/254; 510/269; 510/372		Sullivan, Thomas E. et al.	☒	☐	☐	☐	☐	☐	☐	US 4746369	☐

X

US-PAT-NO: 5644147

DOCUMENT-IDENTIFIER: US 5644147 A

TITLE: Electro-optical device incorporating pixel transistors with plural gate electrodes

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The second insulating film is etched using the second gate electrode covered with an anodic oxide as a mask to expose the semiconductor active layer. A metal film for forming the silicide is formed. When a silicon semiconductor is used, the metal material for forming the silicide is preferably a material which allows the silicide to be in ohmic contact or near ohmic low resistance contact with N-type or P-type silicon. For example, appropriate materials include **molybdenum** (Mo), tungsten (W), platinum (Pt), chromium (Cr), titanium (Ti), and cobalt (Co). At this stage, the exposed portion of the semiconductor active layer is in tight contact with the above metal film.

At the first step, a first gate line is formed on an insulated surface. Although the first gate line is preferably formed of a heat resistant material such as silicon, **molybdenum,** and tungsten, other materials may be used. Further, the first gate line may be covered with an anodic oxide on its surface.

Then, the Ti film is etched using an etchant obtained by mixing **hydrogen peroxide,** ammonia, and **water in a ratio** of 5:2:2. The titanium film in areas other than those in contact with the exposed active layer

$$\frac{H_2O_2}{H_2O} = \frac{\frac{5}{9}}{\frac{2}{9}}$$

(e.g., the areas of the titanium film above the silicon nitride film 106 and anodic oxide films) can be removed by this etching process because it has remained in a metallic state in such areas. On the other hand, titanium silicide can be left in place because it is not etched (see FIG. 1(H) and FIG. 2(H)).

First gate line/electrodes 202 and 203 are formed on an insulating surface 201 of a substrate (Corning 7059, 100 mm.times.100 mm) having a 1000 .ANG. thick silicon nitride film formed thereon (not shown). The gate line/electrodes are formed by etching a 3000 .ANG. thick tungsten film formed by sputtering. A heat resistant metal such as **molybdenum** and titanium may be used instead of tungsten.

Next, heat annealing is performed at 450.degree. to 550.degree. C., e.g., 500.degree. C., for 10 to 60 minutes to cause a reaction between titanium and silicon, to form silicide (titanium silicide) regions 214 and 215. The Ti film which has not been subjected to the reaction is etched using an etchant obtained by mixing **hydrogen peroxide,** ammonia, and **water in a ratio** of 5:2:2 (see FIG. 3(H)).

US-PAT-NO: 5062941

DOCUMENT-IDENTIFIER: US 5062941 A
See image for Certificate of Correction

TITLE: Electrolytic process for stripping a metal coating from a titanium based metal substrate

---------- KWIC ---------

To selectively strip a metal compound of the group IVB and VIB metals of the periodic table inclusive of: titanium, zirconium, hafnium, chromium, **molybdenum** and tungsten from a titanium alloy base metal is particularly difficult due to the similarity in high corrosion resistance of both the base metal and coating.

Electrochemical stripping of a metal coating from a metal substrate is well known and is basically the reverse of electrodeposition. A reverse current stripping process is disclosed in U.S. Pat. No. 4,356,069 for removing coatings of chromium and nickel from zinc, steel, aluminum, brass or copper using an aqueous solution of chromic acid, peroxide, sulfuric acid and **water**. A reverse current stripping process is also taught in U.S. Pat. No. 4,128,463 for stripping a coating of a metal carbide such as tungsten carbide from a titanium or titanium alloy substrate. The composition of the electrolyte comprises an aqueous solution of chromic acid or a chromate ion producing material and optionally a sulfate ion added as sulfuric acid. A method for electrolytically stripping a metal containing refractory coating from a base metal using a caustic electrolyte is taught in U.S. Pat.

No.'s 3,151,049 and
4,886,588 respectively.

The present invention relates specifically to an electrolytic process for removing a metal coating from a base metal of titanium or a titanium alloy. Although the process should have applicability to any metal coating which would combine with oxygen for forming an oxide it is particularly suited for use in removing a metal coating of a metal compound of a group IVB and VIB metal of the periodic table inclusive of: titanium, zirconium, hafnium, chromium, **molybdenum** and tungsten. An example of a titanium compound includes titanium nitride, titanium boride and titanium carbide. A typical example of a titanium alloy base metal is Ti-6Al-4V(AMS4928). Any coating method may be used to form a coating on the base metal.

The aqueous electrolyte comprises a source of oxygen as the oxidizing reagent and an acid in a concentration to adjust to pH of the solution to below 4.5 and preferably between 0.5 and 4.5. The source of oxygen can be air which is fed into the solution at a controlled flow rate to provide a desired volume **percent** of oxygen in solution or may be supplied from an oxygen producing compound which reacts with **water** to release oxygen such as **hydrogen peroxide** or another equivalent peroxide source such as, for example, a perborate, peroxydiphosphate, peroxysulfate and the like.

The electrolytic stripping set-up was the same as that in Example I. A solution consisting of **water** and citric acid up to 10 weight percent with a pH value of 2 was used as an electrolyte. 12 .mu.m TiN and 100 .mu.m WC-Co coated Ti-6Al-4V coupons (1.50.times.25.times.50 mm) were immersed into the

electrolyte at approximately 60.degree. C.; a N.sub.2 -20 vol.% O.sub.2 gas was introduced into the electrolyte via a gas dispersion tube with a flow rate of 0.11m.sup.3 /hr. and a 15 Vdc electrical potential was applied between the coated coupon and the cathode ring. The current density was less than 440 amperes per square meter. For approximately 150 and 210 minutes, TiN and WC-Co coatings were removed from the Ti-6Al-4V substrate without any chemical attack to it, respectively.

A TiN coated Ti-6Al-4V impeller was immersed in a solution of 0.3% citric acid, 4.2% H.sub.2 O.sub.2 and 95.5% **water** (in weight percent). The electrolyte had a pH=3 and was kept at 60.degree. C. The coating thickness was approximately 10 .mu.m. A 10 Vdc electrical potential was applied between the impeller and the cathode. After 180 minutes, the coaling was completely removed without any chemical attack to the underlying substrate.

4. A method as defined in claim 2 wherein said source of oxygen is an oxygen producing compound which generates oxygen upon contact with **water**.

5. A method as defined in claim 4 wherein said source of oxygen is selected from the group consisting of **hydrogen peroxide**, perborate, peroxydiphosphate and peroxysulfate.